Historic, archived document

Do not assume content reflects current scientific knowledge, policies, or practices.

A280.39
M34AM
c.5

AMS-410

CHANGES in PROCESSING and MARKETING HIDES

U. S. DEPARTMENT OF AGRICULTURE

Agricultural Marketing Service • Marketing Economics Research Division

PREFACE

This is a preliminary report of some of the changes occurring in the hide industry. It is part of a broad program of research to improve and expand the marketing of farm products, in this instance by helping the hide industry to make adjustments and to solve some of the problems arising from new methods of processing, curing, and marketing hides.

The author is grateful to numerous meat packers, dealers, brokers, tanners, and trade organizations, and especially to the Chas. H. Stehling Co., manufacturers of fleshing-demanuring machines, who made data and information available.

CONTENTS

	Page
Summary	3
Introduction	5
Conventional methods of curing and marketing hides	5
Processing and curing fleshed hides	8
Volume	8
Washing	9
Demanuring and fleshing	9
Trimming	9
Curing	10
Equipment and operating costs	11
Labor requirements	11
Operating costs	13
Marketing fleshed hides	13
Inventories and grades	13
Weight	14
Pricing	15
Brokers and inspectors	16
Transportation	17
Tanners	17

Washington, D. C. October 1960

SUMMARY

Fleshing and demanuring green hides before they are cured appear to offer several advantages to packers and hide dealers. Most firms that cure hides by conventional methods must carry a 60- to 90-day inventory. Fleshed hides can be cured and sold in 1 to 5 days; this eliminates the necessity of carrying a large inventory and frees a large amount of space and capital for more productive uses. Marketing hides in a few days instead of a few months also reduces some of the risk of fluctuating prices.

Fleshed hides weigh about 25 percent less than conventional hides. Therefore, transportation savings are substantial when fleshed hides are shipped.

Marketing of fleshed hides had risen by March 1960 to a rate estimated at 2.2 million hides a year. This is 10 percent of the 22 million cattle hides tanned each year. It was estimated that 4.4 million fleshed hides would be marketed in 1961.

In 1960, ten firms were demanuring and fleshing hides before curing. Four of the ten firms washed the hides before they were cured by one of three available curing methods, conventional salting, fine salt and brine, and agitated wet-brine curing in vats or drums. Four of the ten fleshing firms cured the hides with wet brine in vats.

The investment in a new fleshing and wet-brine curing operation was estimated, on the basis of 1960 costs, at $65,000, exclusive of a building. An estimated minimum of 500 hides a day must be processed to cover this large investment and provide an economical operation. Most of the fleshing companies were processing and curing 800 to 2,000 hides a day, depending on the hours of operation and auxiliary equipment such as conveyors for moving salt and hides.

Five of the firms fleshing hides at the time of this study were combinations or mergers of packers, hide dealers, or renderers that pool their hides to have the minimum volume needed for an economical operation.

Labor requirements for firms curing fleshed hides by salting or by the fine salt and brine method were less than for firms curing nonfleshed hides. Firms curing fleshed hides by the wet-brine method in vats had the lowest labor requirements. While the labor requirements for most companies curing fleshed hides were lower than for conventional hide curing operations, the large amount of power and water used in fleshing operations may offset these labor savings.

Under the conventional method, it has been necessary for some packers and dealers to mix weights and grades of hides sold, because of insufficient volume. The larger the number of hides processed, the more nearly possible it is for fleshing firms to meet the exact weight and grade of hides specified by the buyer.

Proper processing of fleshed hides generally results in higher quality leather. When excess fat, flesh, manure, and foreign matter are removed from hides before curing, salt in the form of brine can penetrate more fully and the hide can be completely cured. On many hides which are not fleshed before curing,

small areas of fat adhere to the flesh, and the salt cannot penetrate these areas. Thus, a poor cure occurs under the fat and appears as a defect in the leather when the hide is tanned.

The importance of proper and complete curing as a step in producing high-quality leather is readily apparent. Leather and leather products are now facing strong competition from substitutes of various kinds in major end uses.

CHANGES IN PROCESSING AND MARKETING HIDES

By John W. Thompson, agricultural economist
Marketing Economics Research Division
Agricultural Marketing Service

INTRODUCTION

Fleshing and demanuring hides--the removal of flesh and foreign matter--traditionally has been done by the tanner after the hides have been cured. Using a newer practice, some packers and dealers wash, demanure, and flesh hides before they are cured. Cattle hides processed by the new method are termed "fleshed hides." These changes in the processing and handling methods of the packer or hide dealer seem likely to have important effects on marketing practices for cured hides.

Changes in and acceptance of new processing, handling, and marketing practices are often slow and costly processes, involving many new management problems. The hide industry has been confronted with many new problems brought about by the marketing of fleshed hides. Some of these important economic problems are: (1) Obtaining the volume of hides necessary if the savings and other benefits of the new methods are to pay for the additional capital investments required; (2) obtaining an adequate yield and quality of leather from the fleshed hides; (3) keeping costs for the new method at favorable levels compared with those for the conventional methods of processing and handling hides through the finished leather; and (4) establishment of grades and pricing policies for fleshed hides.

The primary objectives of this preliminary report are to help the firms that process and market hides to improve efficiency in marketing by understanding and adjusting to changing conditions. Also, the report provides partial answers to some of the questions asked by industry members concerning the advantages, disadvantages, limitations, and acceptance of fleshed hides.

Information for the report was collected by personal interview from four meat packers, three hide dealers, three brokers, three tanners, and two other industry representatives. Other data were compiled from secondary sources and by correspondence.

CONVENTIONAL METHODS OF CURING AND MARKETING HIDES

Hide curing has been done primarily by meat packers and dealers, and is necessary to prevent deterioration before tanning. The curing process consists largely of replacement of the natural moisture in hides with salt brine.

Until the 1950's, most hides were cured by the firms that slaughtered the cattle. Hide dealers, who formerly purchased cured hides from small packers, renderers, butchers, farmers, and small slaughterers, and regraded them, are now purchasing a larger number of green hides and curing them. Apparently it

has become more economical for small slaughterers to sell green hides to dealers who do the curing. Most medium-sized and large packing companies cure their own hides. However, most of these cured hides from packers are sold to dealers, who may sort and regrade them. It is estimated that in 1958 the 950 hide dealers in the United States handled about 80 percent of the hides moving to tanners.

In most packer or dealer hide cellars, a green hide is first trimmed of the tail, snout, lips, ears, and excessive fat before it is salted. Since the hide is subject to decomposition, it must be salted immediately after the animal heat escapes.

Ordinary rock or evaporated salt is used to cure the hides. Salt is first placed on the floor and two men put a hide, flesh side up, on the salt. Salt is then sprinkled liberally over the hide. The outside edge of the hide is usually folded over a few inches to form a straight pack edge. Hide packs are commonly twice as long as they are wide, built to a height of 3 or 4 feet, and usually contain 700 to 1,000 hides. When a pack is completed, it is covered liberally with salt and left to cure for 30 days.

When hides are ready for sale and shipment, they are "taken up" (removed or lifted from the hide pack) and shaken on a "buck." The buck is a heavy wooden frame about 7 feet long and 4 feet wide. It is braced on the inside with cross slats and supported on wooden legs. Four men grasp the hide, flesh side up, and shake it up and down twice over the buck to shake off the loose salt.

When hides are taken up for shipment by the packer or dealer, it is the custom to have present a hide inspector representing the buyer. The inspector's duty is to appraise each hide for quality, excess salt, manure, grubs, grade, and weight. The packer or dealer generally uses his hide cellar foreman as his representative. The inspector and the foreman must agree on the weights and grades before the hides can be sold. Until World War II, taking up, agreeing on the grade, and loading 1,000 hides took 2 or more days, but now it is common to take up 1,000 hides in 1 day, with much less negotiation. This has helped reduce some of the labor costs in taking up hides.

After the grade is determined, the hide is folded into a square bundle with either flesh or hair side out, depending on the buyer's preference. Commonly a two-ply unoiled sisal rope is used for tying and the hides usually are tagged to indicate the agreed grade and weight.

Most packer and dealer hide sales are made through brokers on a net weight basis, with allowances for the tare or undissolved salt adhering to the hides. Allowances are made also for manure or other foreign matter. Commissions for brokers' services are paid by the tanner or buyer, and in 1960 they were about $250 per carload of hides. The broker generally pays for the services of the hide inspector. Most tanners are located in the Eastern and New England States, and freight charges from the Midwest average about 1½ cents per pound for cured hides.

The biggest problem in properly curing hides is in obtaining adequate penetration of salt into the hide. Salt penetrates the flesh side of a hide faster than the hair side, and the more flesh or fat remaining on the flesh side of a

hide, the more difficult it is to cure. Often a considerable amount of fat adheres to a hide, and penetration of salt brine into this part of the hide is not complete. Thus, a poor cure occurs under the fat, resulting in a defect in the leather when it is tanned.

Conventional methods of curing hides have several disadvantages. Among the most important are: (1) It is necessary for packers and dealers curing hides to carry a large inventory at all times; (2) much space is needed for a hide cellar and the temperature and air need to be controlled; and (3) considerable labor is needed to build hide packs and take up the cured hides.

Under ordinary circumstances, packers or dealers curing hides by conventional methods carry a 60- to 90-day inventory. About 15 to 30 days are required to build each hide pack, because the weights and grades of hides going into each pack are different. Thirty additional days are required for curing after the hide pack is closed, and approximately another 30 days pass between opening the pack, taking up the hides, and shipping them. Under these conditions, packers and dealers always have a large inventory, and considerable capital is continually tied up in their hide cellars. For a packer or dealer who cures 500 hides a day, this represents a continuous inventory value of approximately $125,000 at 1960 prices. At an interest rate of 5 percent annually, this is a fixed overhead cost of $6,250 a year.

The large space needed for a hide cellar and the need to control the temperature and ventilation present a second problem in proper hide curing. A pack of 1,000 hides requires about 580 square feet of floor space. For a packer or dealer who cures 500 hides a day, a minimum of 2,500 square feet is needed, allowing for the center aisle and work space around the hide packs. Many packers and dealers who have increased their volume have had a problem of overcrowded conditions with no room for expansion.

In areas of the United States where basements can be built, cellars are usually located below ground level. For packers, this is generally under the killing and cutting floor. The space allocated for hide cellars cannot be considered as prime space for killing and cutting operations, but it does represent valuable space which can be used for refrigeration units, storage, and other facilities necessary for operation.

Perhaps a greater problem than the space needed for a hide cellar is the control of the temperature and air. Proper hide curing should be done at a maximum temperature of 55° Fahrenheit. Also, the air should be circulated and the humidity held constant at about 85 to 90 percent. If the air is too dry or the temperature too high, deterioration of the hides and an improper cure result. Poor ventilation and light, low ceilings, and the poor drainage of many hide cellars have been continual problems for many packers and dealers. In contrast, most new fleshing operations are in new or completely renovated buildings and the working conditions are excellent.

A third problem in most hide curing operations is the large amount of labor used to handle the hides. In a typical hide cellar where 800 hides a day are cured, a minimum of 27 men are used. During the 1950's, some packers and dealers tried to mechanize their operations to save labor. Common labor-saving devices used by a few members of the industry include: Salt boxes located between

and running the full length of the salt packs; brine hoses; forklift trucks and conveyors for moving the salt and hides; and automatic tyers for bundling the hides. There were savings in labor and costs, but a big disadvantage in the operation of many labor-saving devices is the deterioration of equipment caused by salt and dampness in the hide cellars.

PROCESSING AND CURING FLESHED HIDES

Volume

The number of fleshed hides being marketed at the time of this study was estimated at 2.2 million a year, or about 10 percent of the 22 million cattle hides tanned each year. On the basis of the number of fleshing machines purchased, the number of demanured and fleshed hides marketed was expected to increase to 4.4 million, or 20 percent of the hides tanned, in 1961. With the trend continuing, it appeared probable that 40 percent of the hides marketed in 1963 would be fleshed.

The number of hides demanured and fleshed per machine varied from 2,500 to 9,000 a week. Some firms operated one fleshing machine 8 hours a day, 5 days a week, while others operated as much as 24 hours a day, 6 days a week. Naturally, the number of hides processed varies greatly, depending on hours of operation and the number of fleshing machines operated. In early 1960, 10 packers and dealers were fleshing hides, some firms having 2 demanuring-fleshing machines. The weekly production of fleshed hides is estimated at 40,000 to 50,000 from all firms.

Industry sources indicate that a minimum of 500 hides a day is needed before the "break-even point" is reached. This is the point at which revenues cover fixed and minimum variable costs for installing and operating a fleshing operation. On the basis of a minimum of 500 hides a day, there were some 15 to 20 packers who had a sufficient volume of hides from their own operation at the time of this study, to warrant the installation of fleshing machines.

To attain the volume of hides required for an economical operation, several mergers and various forms of integration have developed. These have involved packers, dealers, and renderers in various combinations, including some capable of processing 2,000 hides a day.

The three common means by which the firms pooled hides to attain the volume necessary for an economical operation were: (1) The packers, dealers, or renderers retained ownership of the hides but paid a fixed charge per hide or per pound to the firm that fleshed and cured them; (2) the hides were sold green by the packer, dealer, or renderer outright to the firm that owned and operated the fleshing and curing operations; (3) the packers, dealers, or renderers, or a combination of these firms, incorporated a new fleshing-curing firm; all the hides from each firm were sold to the new corporation on a green weight basis, and profits were divided among the participating firms on the basis of the weight and number of hides sold to the jointly owned corporation.

Washing

Washing green hides in a revolving cylinder into which water is sprayed, is the first operation in most fleshing plants. Washing should be done as soon as possible after the hides are removed from the slaughtered animal. In 4 of the 10 fleshing operations, hides were washed as they came from the killing floor or arrived at the plant. Washing serves two basic purposes: (1) To lower the temperature of the hide immediately, thus avoiding decomposition, and (2) to remove loose foreign matter and soften any manure adhering to the hair side of the hide. While it is not absolutely necessary to wash hides before fleshing, it is desirable, and most of the new fleshing firms that were planning to be in operation by 1961 planned to install hide washers.

Fleshing and Demanuring

The second and most important operation is fleshing and demanuring. Half the hide is placed between rotating steel and rubber rollers, which are in an open position. The rollers are closed, and the hide is pulled between the scraping rollers where rotating spiral knives, under pressure, scrape the flesh and manure from half the hide. The hide is fed out of the machine automatically and turned around. Then the remaining portion of the hide, not demanured and fleshed on the first scraping, is put in the flesher and subjected to the same treatment. Sometimes, especially when heavy manure is adhering to the hide, it is necessary to pass the hide through the demanuring operation a second time. Adjustments for variations in hide thickness are automatic, but, in addition, a manually operated wheel can adjust the scraping height by as little as 0.0001 inch.

As the hide comes from the fleshing machine, it is clean of all foreign matter on the hair side, and the flesh side is clean to the "corium," or true skin. The fleshings or scrapings from the hide can be sold to renderers. The value is largely dependent on the amount of water they contain and the price of inedible tallow. Rendered fleshings make a low-titer, or hard, grease.

Trimming

The third operation is "trimming" the hide to remove the portions not to be used for leather. In some plants, hides were trimmed before fleshing, but in most operations, trimming was done after the hide was fleshed. Almost all fleshed hides were trimmed to tanner specifications prior to curing. There was no standard trim throughout the hide industry, but the following trim was common for fleshed hides: (1) Front shanks trimmed between the bottom of the leg and the knee; (2) hind shanks trimmed halfway between the bottom of the leg and the end of the shank; (3) heads horseshoe-trimmed through the eye, and the head squared on both sides; (4) Kosher heads trimmed on a straight line with the Kosher cut; (5) tails trimmed a maximum of 4 inches from the root; (6) pizzles and cow udders trimmed on a straight line with the belly. In some instances, the entire head was removed and shanks were removed at the knee.

The "tanner trim" removes, from a heavy hide, 8 or 9 pounds of hide, or about 12 to 15 percent. These trimmings have a use as glue stock.

Curing

Curing is the fourth and most varied operation. Three basic methods were used: (1) Conventional pack salt curing, (2) a combination of fine salt and brine, and (3) wet-brine curing in drums or vats. When hides are fleshed, salt can penetrate the hide quickly and the time needed for curing is short. Lengths of time for curing fleshed hides varied from a minimum of 14 hours to a maximum of 4 days, depending on the type of cure.

Conventional pack salting of fleshed hides requires the least investment and smallest changes in methods of curing. In most instances, facilities and methods used in nonfleshing operations are adequate. Fleshed hides can be built in conventional packs, salted flesh side up, and left to cure. A good method for salt-curing fleshed hides is to build one pack a day for 4 days in conventional pits and then take up the first pack on the fifth day. If the number of hides salted is 1,000 a day or less, 1 pack is built and 1 pack taken up per day. Total curing time is 4 days.

A fine salt and brine combination is a second alternative. As hide packs are built, fine salt is sprinkled liberally on the flesh side and a brine solution is sprayed on the salt. These packs must be built in pits to keep the brine solution around the hides. It is common with this operation to have four pits, each holding a day's volume. A pack is built the first day and allowed to cure until the third day, when the brine is drained, and the hides are taken up on the fourth day. It is possible to shorten the curing time, if necessary, in both the conventional and fine salt and brine curing methods.

Wet-brine curing can be done in drums or vats. In drum curing, green hides are placed in giant drums, holding 3,000 to 6,000 pounds. The hides are subjected to several washings in cool water for 5 to 10 minutes each, and are allowed to drain. Salt is added to the drum and the curing starts. Additional salt is added after 1 hour, and curing continues for 2 or more hours. The drum is then emptied and the hides are drained for 24 hours before shipping.

Wet-brine curing in round or oval vats, commonly called "racetracks," appeared to be the most popular method of curing fleshed hides when this study was made. While only 4 of the 10 fleshing firms in operation early in 1960 used the "racetrack" or vat cure, most of the new fleshing operations planned were expected to use this method. Most wet-brine curing operations used two vats. One vat was loaded and cured while hides were taken out of the other.

Oval vats for curing were usually 39 feet long, 18 feet wide, and 5 to 6 feet deep, depending on the brine level. Some firms were installing round vats about 40 feet in diameter. Most vats were built to hold about 39,000 pounds of hides, and had an island in the middle. A paddle wheel, about 3 feet in diameter, was located on each side of the vat between the island and the outside

wall of the "racetrack." The paddle wheels revolved at 10-20 revolutions per minute. Some firms ran their paddle wheels intermittently while other firms ran them continuously to help circulate the hides and brine. As the paddle wheels revolved, the hides moved slowly around the "racetrack."

On the island in the center of the "racetrack" was a large salt box into which brine from the vat was continually pumped for strengthening. If wet-brine curing is to be done properly and in minimum time, it is imperative that the brine solution be at full strength. Curing vats should be emptied and cleaned every 15 to 30 days. A few "racetracks" used compressed air injected into the bottom of the vat to bring hides to the surface after they were cured. When hides are removed from the vats, they must be drained, and this was done by placing them on wooden horses or wooden pallets. Hides cured with wet brine usually were drained 8 to 24 hours before they were bundled for shipment. The use of a hide wringer, being tested at the time of this study, may sharply reduce the time required for draining.

EQUIPMENT AND OPERATING COSTS

The cost of equipment for fleshing and curing hides varied greatly, depending on the type of operation, volume of hides handled, and method of cure. A typical wet-brine curing operation included a washer, demanuring and fleshing machine, and two "racetracks" or curing vats. Exclusive of the building and auxiliary equipment, the approximate costs in early 1960 for a demanuring-fleshing operation capable of handling 800 hides a day and curing them in vats was approximately $65,000 (table 1). The land and building costs varied greatly, depending on the size and location. Several fleshing firms reported costs of a new operation as a minimum of $100,000. For packers and dealers who do not desire to wash hides before fleshing, and who cure hides in conventional salt packs, the only expenditure necessary to add a fleshing operation is the demanuring-fleshing machine, costing in 1960 approximately $35,000 installed.

Labor Requirements

Labor requirements for fleshing and curing 800 hides a day varied according to the type of cure and the auxiliary equipment such as conveyors and fork-lift trucks for moving hides and salt (table 2). Packers and dealers who installed fleshing machines and cured their hides by conventional salting needed 7 to 9 men per 8-hour day, depending on the auxiliary equipment. Fleshing firms curing by the fine salt and brine method also needed 7 to 9 men to wash, flesh, trim, cure, and drain hides and build packs. An additional 12 to 15 men were needed daily to take up and bundle the hides.

Labor requirements for most firms that cured hides by the wet-brine method were less than for firms using other methods. In some plants, only four to six men were needed to flesh and trim the hides. Takeup crews of 7 to 9 men were common in a typical wet-brine curing operation processing 800 hides a day.

Table 1.--Estimated equipment cost for a demanuring-fleshing operation curing approximately 800 hides per day by the wet-brine method, 1960

Basic equipment	Cost	Machine capacity in hides	Fresh water supply per hour	Motor requirements
	Dollars	Number	Gallons	Horsepower
20-ft. hide washer	4,500	1/40-120	2/2,500	7.5
30-ft. hide washer	6,700	1/60-180	3/2,400	10.0
Demanuring-fleshing machine	35,000	80-120	800	4/80.0
2 curing vats	24,000	5/ 800	---	
4 paddle wheels	6,000	---	---	6/20.0

1/ Capacity varies according to the length of time hides are washed.
2/ Water requirements are 7,500 gallons per hour with 5,000 gallons recovered.
3/ Water requirements are 12,000 gallons per hour with 9,600 gallons recovered.
4/ Fleshing cylinder 50 hp., manuring cylinder 15 hp., feed roll 7.5 hp., and pump 7.5 hp.
5/ The number of hides per curing vat varies depending on the weight of the hides and size of vat.
6/ Each paddle wheel 5 hp. Brine recirculating pumps not included.

Table 2.--Estimated average labor requirements for firms curing approximately 800 hides per 8-hour day by different methods 1/

Curing method	Employees needed	
	Processing, trimming, and curing 2/	Takeup, bundling, and loading
	Number	Number
Conventional operation	14	12-15
Fleshing operations with:		
Conventional salting	7-9	12-15
Fine salt and brine	7-9	12-15
Wet brine 3/	4-6	7-10

1/ If the firm operates 16 hours a day, the labor requirements are generally divided between two 8-hour shifts.
2/ Almost all fleshing firms utilized auxiliary equipment, such as conveyors and forklift trucks, which was the main reason for having lower labor requirements than a typical conventional curing operation.
3/ Some highly mechanized fleshing and wet-brine curing operations are reported to have reduced their labor requirements below this number of employees.

It appears that wet-brine curing requires less labor per 1,000 hides handled than the other methods and lends itself better to mechanization.

It is relatively easy to mechanize many fleshing operations. Conveyors can be used to move hides to or from the washer, trimming table, fleshing machine and curing pits or vats. Hides can also be lifted from the curing pits or vats by conveyors and carried to the drainage and bundling areas. In many operations, forklift trucks are used to move the hides and salt.

Wages varied greatly throughout the hide industry. Some dealers in the Midwest, interviewed for this study, reported that starting wages of hide cellar employees were $1.25 an hour. Other dealers reported starting wages of $1.78 an hour. Packers in the Midwest reported that new employees in the hide cellar received about $2.17 an hour.

Operating Costs

Labor requirements generally were lower in firms fleshing hides than in firms processing and curing hides by conventional methods. However, the investment in and maintenance of equipment, along with increased power and water requirements for a fleshing operation, can offset the labor savings. In general, average costs in 1960 for processing, curing, and marketing fleshed hides are estimated at $2.20 to $2.30 per 100 pounds of hides cured. This includes the hide takeup cost of about 35 cents per 100 pounds. Costs of handling and curing conventional hides were about the same. Most fleshing operators reported higher operating costs the first few months, or until the operation was running smoothly.

MARKETING FLESHED HIDES

Hides are a joint product in slaughtering and marketing of livestock, and the supply does not increase or decrease appreciably with changes in the demand for hides for use in leather manufacture. Reductions in demand do not bring large reductions in supply, nor do increases in demand bring increases in the supply of hides marketed. Under ordinary circumstances, a packer, dealer, or renderer has a 60- to 90-day inventory of hides on hand, and frequently he must sell some at any price to make room for new hides. The packer, dealer, or renderer who puts hides down in conventional packs does not know what the value of the hides will be when they are taken up for shipment 60 to 90 days later. Thus, he is subject to a considerable price risk.

Inventories and Grades

In contrast with conventional methods, the processing and marketing of fleshed hides is accomplished quickly.Most packers and dealers can sell and ship their hides within 5 days, eliminating the necessity of carrying a large inventory. In several fleshing operations, hides are fleshed, cured, drained, bundled, and could be shipped within 1 or 2 days. This not only reduces the inventory of hides but also reduces the risk of sizable price variations. Reducing inventories from 2 to 3 months to a few days also saves capital and

interest. As indicated on page 7, a firm that cures 500 hides a day in conventional packs has a continuous fixed overhead cost for inventory of $6,250 a year.

Better grading of hides is a second advantage of fleshing firms. Differences in hides due to size and weight and biological and physical damage have always made grading of hides a problem. Biological and physical damage such as warts, grubs, sores, rubs, scuffs, and deep scratches are found on many cattle when they are marketed, and the slaughterer or packer has little control over these defects. Often the amount and extent of these damages are not easily recognized when the cured hides are marketed. Fleshing and demanuring the hide makes it much easier to see and evaluate this damage. Some packers or slaughterers purchasing cattle from farmers pay $1 extra per animal if the farmer has treated his cattle for grubs and if the hide is free of grub damage.

When the flesh is removed from a hide, it is easy to recognize also the damage done by butchers' knives and to correct it. It appears that fleshing operators have been able to control butcher damage much more successfully than packers and dealers who follow conventional methods of salting hides. Many packers continually strive to reduce knife damage by paying their skinners a weekly premium on the basis of the number of hides free of knife damage. Marketing a highly select grade and weight of hides is a third advantage of a fleshing operation.

Processing a large volume of hides daily makes it possible for fleshing firms to assemble for sale the exact weights, grades, and types of hide the many buyers desire. In the plants visited for this study, the hides were carefully graded according to sex, age, weight, size, and quality to meet buyers' specifications. Most tanners like to purchase a closely selected grade and weight of hides. In the past, many packers and dealers who cured less than 100 hides a day marketed their hides on a "flat basis," or mixed several grades and weights to make a full carload. While this practice was necessary for the small packer or dealer, it usually lowered the value received for the hides.

Weight

All hides are sold on a weight basis. Thus it is extremely important to the buyer and seller that correct weights are determined. The weight of a demanured, fleshed, and tanner-trimmed hide varies greatly from that of a conventional hide. Shrinkage also affects the final weight.

It is not possible to estimate correctly the exact amount of manure, foreign matter, flesh, and fat adhering to a hide that has not been fleshed. In some packer operations, skinners were not always careful and left more fat and flesh on the hides than the skinners at other plants. Also, the amount of manure and foreign matter on the hair side of hides varies from month to month, and no two animals slaughtered have hides of the same weight. It is difficult to find agreement in the industry on the weight loss between fleshed and conventional hides. However, it should be apparent that the amount of trim, manure, flesh, fat, foreign matter, and meat removed from fleshed hides varies greatly for each hide, depending on the weight, size, sex, age, time of year, area of the country, and skinning practices.

All fleshed hides are given a "tanner trim," which reduces the weight of a steer hide by an estimated 12 to 15 percent, or 8 to 9 pounds, under that of a conventional hide. Washing alone usually removes 3 to 4 percent of the weight in sand and dirt. Estimates for the weight of manure, flesh, and fat removed in a fleshing operation vary greatly.

The most common estimates of weight loss used by fleshing firms for cattle hides are 22 to 28 percent, although some fleshed hides have been sold above and below this range. The weight removed from hides in the washing, demanuring-fleshing, and trimming operations visited for this study averaged 25 percent. Fleshed and trimmed hides from cows are usually sold at a lower fleshing percentage than are steer hides.

When marketing conventionally cured hides, it is necessary to determine, by estimating or by weighing, the "tare" or excess salt adhering to the hides. Over the years, big packers have sold hides generally with a 3.5 percent tare allowance. There is no tare allowance on fleshed hides, so for them the problem of determining the tare of excess salt is eliminated.

Shrinkage, the difference between the weight of a hide before it is cured and after it is cured, is an important factor. In general, the cured weight of a conventional hide is 12 to 25 percent less than the green weight. Determining the shrinkage of brine-cured hides can be a difficult problem. The shrinkage of brine-cured hides, or amount of moisture which the hides lose after brine curing, varies 1 to 5 percent, depending on the length of time the hides are drained, length of time in storage or transit, and temperature and humidity at which they are held. A properly cured hide should have less than 50 percent moisture and more than 12 percent salt, and an ash-to-moisture ratio approaching the saturation value of 34.5.

The weight of the fleshed hides being marketed in 1960 was based on what the weight would have been had the hide not been washed, demanured, and fleshed. It would be more realistic to use the weight of properly trimmed hides, free of all manure, flesh, fat, and foreign matter, and with a standard moisture content as the highest grade of hide, and to discount other hides. Early in 1960, the hide industry was attempting to compile new grades and standards for hides from small packers. Since an estimated 20 percent of the hides marketed in 1961, and possibly 40 percent in 1963, may be fleshed, there has developed an urgent need for new grades and standards for fleshed hides.

Pricing

Pricing of hides has always required considerable negotiation. Fleshed hides as a commodity are quite different from conventional hides. Making allowances for changes in the trim and for the amounts of flesh and manure removed has made the establishment of prices for fleshed hides difficult. In early 1960, no trade publications carried price quotations for fleshed hides.

Three basic factors affect prices of fleshed hides: (1) The market value of conventional hides, (2) the fleshing percentage, and (3) the premium or discount for butcher damage and biological defects.

The market value of conventional hides changes frequently, and there are large differences in the price per pound for each type and grade of hide. Over the years, "big packer" hides have brought a few cents a pound premium above standard hides. 1/ Most of this premium is attributable to the ability of the big packer to sell a large volume of hides of closely selected grade and weight with a minimum of butcher damage. Many other packers and dealers also have received premiums for excellent quality and minimum butcher damage.

Some fleshed hides have been sold on the basis of "big packer" hide prices. Thus, small packers and hide dealers who integrated to form a fleshing operation were in a position to receive the big-packer price for hides. The major factor making it possible for fleshing firms to receive an above-average price for their hides is the result of fleshing. It is much easier to inspect fleshed hides for butcher damage and to control the butcher damage. Thus, fleshing firms can market hides which have a takeoff quality equal to or better than an average big-packer hide. This helps defray the cost of fleshing. Packers who have always sold big-packer selections do not have this price advantage.

The most common method of pricing fleshed hides has been based on the price of conventional hides plus a percentage margin. An example of the pricing method follows:

Assuming that heavy native steer hides are selling for 12 cents a pound and the seller of the fleshed hides is agreeable to a 25 percent fleshing loss, the weight of the fleshed hide is 75 percent of the original weight. Then, 12¢ a pound ÷ 75% = 16¢ a pound for the fleshed hide.

Most firms marketing fleshed hides have sold on the percentage margin basis. However, alternative methods of pricing based on a percentage markup have been used. Usually the value of hides is computed from the total weight of hides sold, and not on an individual pound or hide basis.

No two firms visited in this study had the same fleshing percentage. Some firms also changed their percentages and methods of calculation, depending on changes in processing, curing, type of hide, time of year, and market conditions.

Discounts for cuts, scores, off patterns, and grub damage remained the same as those used when selling conventional hides. If more than 10 percent of the hides sold had butcher damage, the buyer discounted all hides 1 cent per pound. If the grub damage was above the allowance (the allowance changes each month of the year), the hides were discounted another cent a pound.

Brokers and Inspectors

Almost all hides from packers and dealers were sold through the 275 brokers, importers, and exporters in the United States. If brokers were not used in marketing hides and skins, each of the more than 550 tanners in the United States would need his own purchasing organization. Some tanners, such as upholstery tanners, bought only at a certain time of the year. To maintain a

1/ "Big packers" as referred to in this report are packers that slaughter more than 500 cattle a day.

full-time purchasing staff, familiar with all the prices, grades, weights, and offerings of hides from packers and dealers throughout the United States, would involve a considerable staff and cost.Thus, the broker, who is familiar with local offerings, weights, and grades, is an important middleman for buyers and sellers of cured hides.

Brokers receive their commissions on the weight of hides sold. Fleshed hides weigh less than conventional hides, and thus commissions, usually at the same rate, are reduced accordingly. The commission on a carload of hides in 1960 was about $250, paid by the tanner. However, the broker furnished a hide inspector who represented the buyer when hides were taken up. The broker then guaranteed the quality and grade of hides bought by the tanner.

A few firms have attempted to market fleshed hides through brokers without a hide inspector present when the hides were taken up. These firms guaranteed the grade and quality of the fleshed hides to the buyer. While this practice saves the wages of a hide inspector, it may increase the risk of dissatisfaction between the buyer and seller as to the correct weight and grade of hides. The inspector is usually looked upon as an impartial judge of the quality of each hide.

Transportation

Substantial savings in transportation can be made when fleshed hides, rather than conventional hides, are marketed. Most tanners were in the northeastern part of the United States at the time of this study, and meat packing operations were concentrated in the Midwest and Southwest. The freight rate for hides shipped from the Midwest and Southwest was about $1.50 per 100 pounds; thus, transportation savings on fleshed hides shipped from the Midwest to the East were roughly 20 cents per hide. On a shipment of 1,000 hides, this is a $200 transportation saving.

Most packers and dealers shipping hides put several inches of salt on the floor of the railroad car. Fleshed hides can be shipped without salt on the floor, if the floor is lined with paper. This change eliminates messy conditions. Salt and paper costs are approximately the same, but the labor to spread the salt is greater than to put down paper.

Some efforts were being made in the industry early in 1960 to ship hides on wooden pallets. This practice could benefit both the buyer and seller by eliminating much of the labor in loading and unloading hides.

Tanners

The tanner must consider three questions before he purchases fleshed hides: (1) What changes are necessary in the tanning operation, (2) what is the yield of leather and cost of tanning fleshed hides, and (3) will fleshed hides result in a higher quality leather and thus increase leather sales?

The demanuring and fleshing of hides traditionally has been done by the tanner. Over the years he has installed the equipment for doing this job and his labor force has become well trained. If such a tanner purchases a carload

of fleshed hides, his equipment for demanuring and fleshing the hides stands idle and the labor crew must be diverted to other work. Many tanners have indicated they are willing to purchase fleshed hides if the volume marketed increases and if they can eliminate the demanuring-fleshing operation.

Some tanners contacted in this study reported that it was necessary to reflesh a few hides they purchased, because the hides were not properly fleshed by the packer or dealer. Other complaints of tanners concerned excessive "chatter" damage to hides, caused by improper fleshing machine adjustment or operation, and muddy hides.

Two other changes a tanner might find necessary when tanning fleshed hides are: (1) Changes in solutions and length of time for tanning may be necessary, and (2) the storage and handling of fleshed hides may be different than the storage and handling of conventional hides. Changes in any business require time and usually money. Because hides are a perishable commodity and the length of time needed to tan them is several days to many months, changes in the hide industry may be difficult. Packers and dealers marketing hides were of the opinion that less than half the tanners had made the necessary changes in their tanning operations to process and handle fleshed hides.

The second problem confronting tanners is determining the yield of leather and the cost of processing, tanning, and marketing fleshed hides. Over the years, tanners have established their costs of operation and yields of leather from conventional hides. This includes a value for the fleshings and trimmings. The changes necessary in the operation when fleshed hides are tanned change the processing costs and perhaps the yield of leather. Accurate cost and yield data require computations over a long period of time. Tanners purchasing both conventional and fleshed hides have a cost accounting problem in between the costs and yield for each type. The tanner, if he pays a higher price per pound for the fleshed hides, must be able to recover this cost.

Will fleshed hides result in a higher quality leather and thus increase sales? That is another question confronting tanners. Leather and leather products have been meeting strong competition from synthetic leather substitutes. In 1942, 78 percent of all shoes manufactured had leather soles; 2/ in 1959, only 30 percent. To meet the increased competition of leather substitutes, leather and leather products must be of excellent quality, and it is impossible to produce a high-quality leather without proper curing. Fleshing, followed by good curing and tanning, can result in a superior leather. Fleshing hides before curing makes it possible to attain a completely cured hide.

The hide industry is going through tremendous changes. Methods of processing, curing, and marketing will be subject to further technological changes. With a continuing upward trend in livestock production, it will be necessary to process and market increasing supplies of leather and leather products. Further developments in technology may help the hide industry to meet the competition of leather substitutes. Therefore, the active cooperation of all segments of the industry in solving the technological and economic problems involved in the processing, curing, tanning, and marketing of hides, leather, and leather products is desirable.

2/ Trade Survey Bureau, Tanners Council of America.